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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,422	06/29/2001	Keiji Kanao	P 0281522	5223

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EXAMINER

LEURIG, SHARLENE L

ART UNIT	PAPER NUMBER
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2879

DATE MAILED: 12/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/893,422

Applicant(s)

KANAO, KEIJI

Examiner

Sharlene Leurig

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

1. Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2 and 7 are rejected under 35 U.S.C. 103(a) as being obvious over Osamura et al. (6,094,000) in view of Abe et al. (6,215,234).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR

1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Regarding claim 1, Osamura discloses a spark plug with a tubular housing, a central bar electrode inside the tubular housing with electrical insulation in between the two, a first bar discharge member (Fig. 2 element 5) being arranged at one end of the central bar electrode, comprising Ir alloy (column 2, line 34), and protruding from one end of the tubular housing along an axis of the center electrode, a plate ground electrode (Fig. 2 element 4) being arranged at one end of the tubular housing in a radial direction of the axis and having an end surface confronting a side surface of the first bar discharge member, and a second discharge member (Fig. 2 element 6) being arranged on the end surface and having a surface confronting the side surface of the first bar discharge member. A spark discharge is generated at a gap between the first and second discharge members. The width D of the side surface of the first bar discharge member in a normal direction of a plane including the radial direction and the axis can be equal to or greater than 1.6 mm (column 2, line 47). Regarding claim 2, Osamura discloses a width D that is equal to or lower than 5.0 mm (column 2, line 47). The width

A of the surface of the second discharge member confronting the first discharge member can be as little as 0.3 mm less than the width D. Therefore the difference between widths A and D is equal to or lower than a result of adding 0.5 mm to G for any spark gap width. Regarding claim 7, Osamura discloses first and second discharge members comprising Ir and at least one of Rh, Pt, Ru, Pd and W (column 3, lines 29-31 and 66-67).

Osamura discloses a spark plug with all the limitations discussed above, including a spark gap, but is silent on the limitations of the spark gap width. However, Osamura discloses a goal of improving the lifetime of the spark plug. Abe teaches a spark gap width of between 0.2 and 0.4 mm so that "the required voltage for producing sparks is relatively low" (column 2, line 15) in an effort to "secure the long life of the spark plug" (column 1, line 29). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Osamura's spark plug with a gap width within the range of 0.2 to 0.6 mm to attain a spark plug with an extended lifetime.

4. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamura et al. (6,094,000) in view of Abe et al. (6,215,234) as applied to claims 1, 2 and 7 above, and further in view of Yamaguchi et al. (4,700,103). Osamura discloses a spark plug with all the limitations discussed above but lacks a specified spark gap width. Abe teaches a spark gap width of between 0.2-0.4 mm. Both Osamura and Abe lack a welding portion with a specified cross-sectional area, but Osamura discloses the use of laser welding to attach the first discharge member to the central electrode (column 2, line 60) and discloses a goal of increasing the lifetime of the spark plug. Yamaguchi

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teaches a method of welding a first discharge member to the central electrode in order to form an enlarged flange to increase the welded joint area and consequently increase the joint strength in order to improve the durability and lifetime of the spark plug (column 2, lines 4-10). Yamaguchi teaches the welding of one end of the central electrode to a surface of the first bar discharge member on the sides of the central electrode (Fig. 4, interaction between elements 9 and 4). Yamaguchi's weld portion between the central electrode and the first discharge member has a cross-sectional area on a plane perpendicular to the axis equal to or lower than 8 mm^2 . The weld portion has a diameter of 1.4 mm after welding, meaning it has a radius of 0.7 mm and a cross-sectional area equal to πr^2 , which is equal to 1.54 mm^2 and less than 8 mm^2 . Therefore it would have been obvious to modify Osamura's spark plug with a specified spark gap width G and with welding spots on the sides of the central electrode and with a weld portion having a cross-sectional area of equal to or less than 8 mm^2 in order to improve the lifetime of the spark plug.

5. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamura et al. (6,094,000) in view of Abe et al. (6,215,234) as applied to claims 1, 2 and 7 above, and further in view of Yamaguchi et al. (JP 9007734) (of record). Osamura discloses a spark plug with all the limitations discussed above but lacks a specified spark gap width. Abe teaches a spark gap width of between 0.2-0.4 mm. Both Osamura and Abe lack a specified distance between the welding portion and the second discharge member, but Osamura discloses the use of laser welding to attach the first discharge member to the central electrode (column 2, line 60), a weld portion that does

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not confront the surface of the second discharge member (Fig. 2), and further discloses a goal of increasing the lifetime of the spark plug. Yamaguchi teaches a distance between the weld portion and the second discharge member greater than the spark gap width G , and preferably greater than a result of adding 0.3 mm to G (paragraph 0017), which encompasses the claimed range of greater than the sum of G and 0.2 mm, in order to increase the lifetime of the spark plug by preventing discharge from reaching the welding joint (paragraph 0016). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Osamura's spark plug with a specified spark gap width G and a distance between the weld portion and the surface of the second discharge member greater than G by at least 0.2 mm in order to improve the lifetime of the spark plug.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharlene Leurig whose telephone number is (703)305-4745. The examiner can normally be reached on Monday through Friday, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703)305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Sharlene Leurig
December 4, 2002

SL



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